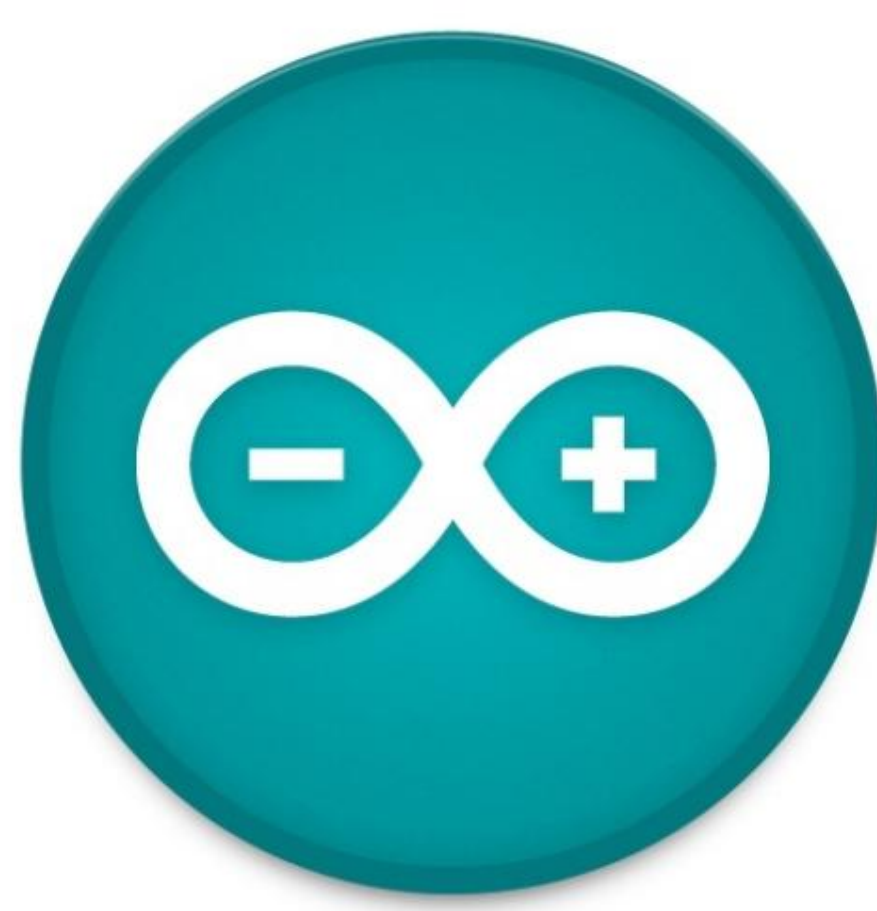




Movement from Code

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Abstract

The purpose of this project was to expand my knowledge of programming. I am interested in engineering and the circuitry and coding were what I didn't understand. I conducted research into programming and operating arduino and used the skills I gained to build a robot. I then incorporated an rf transmitter and receiver so that my robot could be controlled wirelessly.

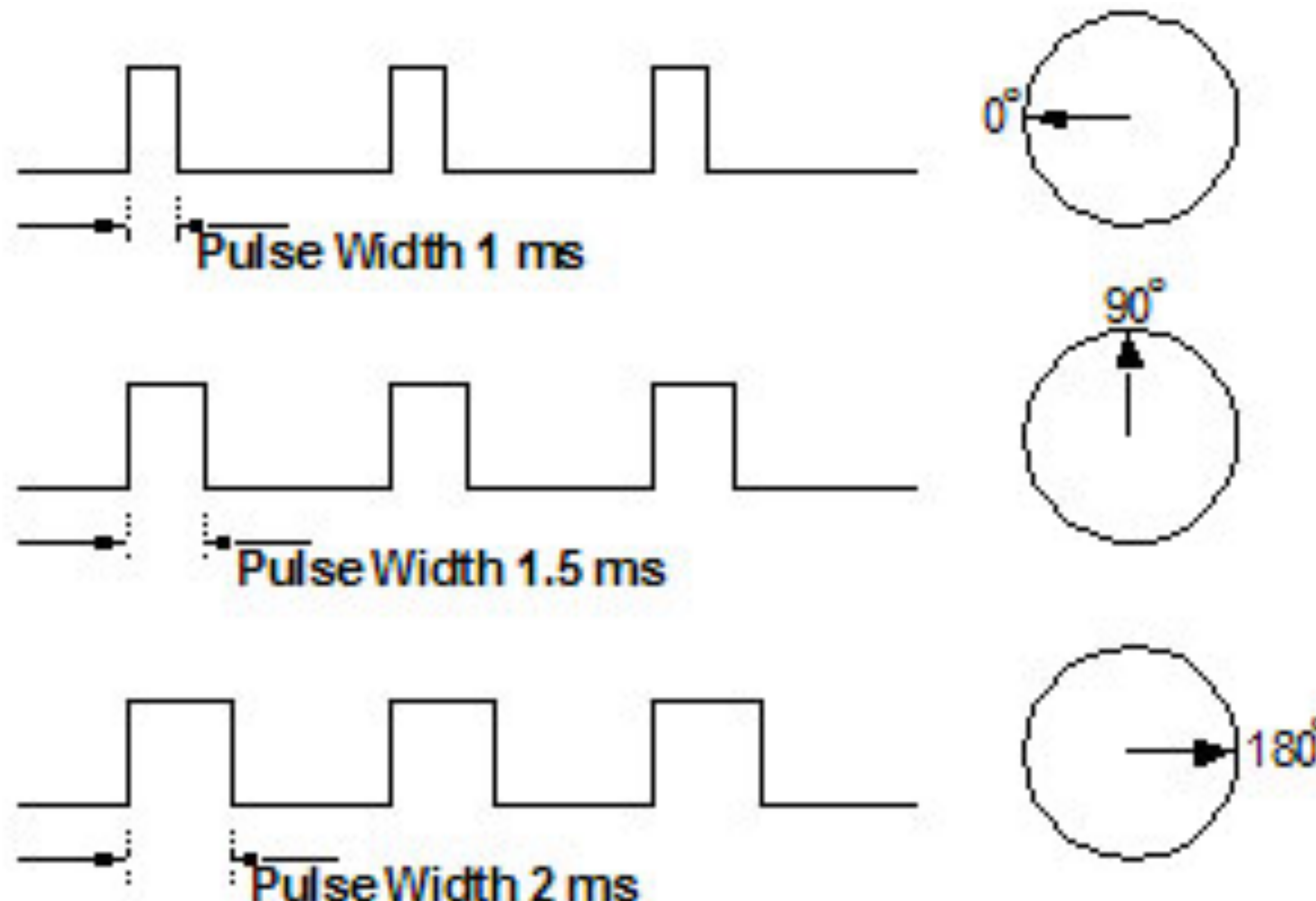
Intro to Arduino

Arduino is an electronics prototyping platform. Using pins and sockets, arduino makes it easy to make complex circuits. It uses a language similar to C code which allows it to do certain things given certain conditions. One such example would be

```
Void loop(){  
  if (pin7 == 1)  
    digitalWrite(pin12,HIGH)  
  This means if pin 7 is receiving a signal,  
  send a high powered signal from pin 12.
```

Servos being controlled by pulses

Minimum Pulse



Arduino Code

```
int ENA=A5;  
int IN1=A4;  
int IN2=A3;  
int ENB=A0;  
int IN3=A2;  
int IN4=A1;  
int BPin = 7;  
void setup(){  
  if(BPin,HIGH){  
    digitalWrite(ENA,HIGH);  
    digitalWrite(ENB,HIGH);  
    digitalWrite(IN1,HIGH);  
    digitalWrite(IN2,LOW);  
    digitalWrite(IN3,HIGH);  
    digitalWrite(IN4,LOW);}  
  pinMode(ENA,OUTPUT);  
  pinMode(ENB,OUTPUT);  
  pinMode(IN1,OUTPUT);  
  pinMode(IN2,OUTPUT);  
  pinMode(IN3,OUTPUT);  
  pinMode(IN4,OUTPUT);  
  pinMode(BPin,INPUT);}  
void loop(){  
  analogWrite(ENA,225);  
  analogWrite(ENB,255);}
```

Explanation of Code

The code to the left was used to program my robot to move all four wheels forward. In order to affect the direction the wheels turn, locate the void setup() group. within void setup(), look for the if(BPin,HIGH) statement. the differences between any two turning directions are evident in the digitalWrite commands of IN1 through IN4. IN1 and IN4 control forward movement while IN2 and IN3 control backwards movement on motorA and motorB respectively. when IN1 is larger than IN2, motorA will move forward. if IN3 is larger than IN4, motorB would move backward. the "if" statement causes everything within the { }'s to happen if and only if the conditions within the ()'s are true.

Goal

My goal was to make a robot which I could wirelessly control to move forwards, backwards, and to both sides. In order to do this I had to incorporate RF (radio frequency) transmitters and receivers. My goal was to connect a transmitter to a remote and its receiver to my robot. I planned to then tell the board attached to the receiver to activate certain strings of code if certain signals were picked up.

Servos

Servos work by sending a variable pulse through the control wire which sets what angle the servo will move to. Servos are different than motors because instead of spinning continuously, they are used to swivel to a certain position.

Radio Frequency

Radio waves are a form of electromagnetic waves, which are caused by oscillations in electrons. By artificially creating waves of electrons, we can send signals between two devices.

Bibliography

"How Do Servos Work?" *How Do Servos Work?* N.p., n.d. Web. 11 Mar. 2013.
"How Radio Works." *HowStuffWorks*. N.p., n.d. Web. 11 Mar. 2013.

